[0047] The wireless power-receiving apparatus may be applied to various devices in addition to the mobile terminal **310** and the wearable device **320** illustrated in FIGS. **1** and **2**.

[0048] In this manner, the wireless power-receiving apparatus may be applied to various devices, and the wireless power-transmitting apparatus **100** according to the embodiment changes settings of wireless charging in response to an identification/determination of the wireless power-receiving apparatus applied to such various devices.

[0049] For example, the wireless power-transmitting apparatus **100** communicates with the wireless power-receiving apparatus to verify e.g. class, category, power requirements, or capability information of the wireless power-receiving apparatus and responsively control a variable resonator of the wireless power-transmitting apparatus according to the verified class information.

[0050] Hereinafter, various embodiments will be described in more detail with reference to FIGS. **3** to **8**.

[0051] FIG. **3** is a block diagram illustrating a wireless power-transmitting apparatus according to an embodiment.

[0052] Referring to FIG. **3**, the wireless power-transmitting apparatus **100** includes a power supply **110**, a power transmitter **120**, and a controller **130**.

[0053] The power supply **110** generates a predetermined level of power using externally input power. The power supplied by the power supply **110** is supplied to the power transmitter **120**.

[0054] The power transmitter **120** operates a variable resonator **122** using the power supplied from the power supply **110** and wirelessly transmits the power to the wireless power-receiving apparatus.

[0055] The power transmitter **120** includes an inverter **121**, the variable resonator **122**, and a capacitance controller **123**.

[0056] The inverter **121** operates in accordance with control of the controller **130**, and operates the variable resonator **122** using the power supplied by the power supply **110**.

[0057] The variable resonator **122** includes, for example, a variable capacitor and an inductor. Since the variable resonator **122** provides variable impedance, it may be magnetically combined with various types of wireless power-receiving apparatuses to wirelessly transmit power therebetween.

[0058] The capacitance controller **123** controls capacitance of the variable capacitor included in the variable resonator **122**.

[0059] The controller **130** controls the power supply **110** and the power transmitter **120**.

[0060] The controller **130** includes at least one processing unit. In some embodiments, the controller **130** further includes a memory. The processing unit may include, for example, a central processing unit (CPU), a graphics processing unit (GPU), a microprocessor, an application specific integrated circuit (ASIC), a field programmable gate arrays (FPGA), or the like, and may have a plurality of cores. The memory may include a volatile memory (e.g. RAM), a non-volatile memory (e.g. ROM, Flash memory), or a combination thereof.

[0061] The controller **130** controls the power transmitter **120** to transmit a ping signal when detecting a change in impedance of the variable resonator **122**. When receiving a response signal of the wireless power-receiving apparatus to the ping signal, the controller **130** verifies class information from the response signal.

[0062] The controller **130** controls the power transmitter **120** to adjust the impedance of the variable resonator **122** in accordance with the verified class information.

[0063] The class information includes a plurality of classes which are classified according to at least one of a type, required/requested power, and impedance information of the wireless power-receiving apparatus.

[0064] In some embodiments, the controller **130** has impedance setting data in which predetermined impedance information is set according to respective classes. Accordingly, when the controller **130** verifies the class of the wireless power-receiving apparatus from the class information, the controller **130** identifies or determines an impedance value corresponding to the verified class from the impedance setting data and then controls the variable resonator **122** to have the verified impedance value.

[0065] In some embodiments, the class information is represented by N bits (herein, N is a natural, integer number greater than 0), and the variable capacitor included in the variable resonator **122** also includes N capacitors connected in parallel. In this case, the class information is used as a control signal controlling the N capacitors connected in parallel. However, other suitable configurations may be employed, as would be known to one of skill in the art, after gaining a thorough understanding of the following description.

[0066] FIG. **4** illustrates respective phases of wireless power transmission.

[0067] Referring to FIG. **4**, the wireless power transmission includes an initial selection phase.

[0068] The selection phase refers to a process step of transmitting, for example, an analog ping signal through a variable resonator, determining a change, such as a change in impedance, caused by the analog ping signal, and determining whether a specific object exists near the wireless power-transmitting apparatus.

[0069] In the specification, the analog ping signal collectively refers to a signal for determining an approach of an external object, and there is no limitation on how to express the signal. For example, a signal represented by another expression according to a standard or an embodiment, such as a beacon signal, may correspond to the analog ping signal as long as it determines whether a specific object exists near the wireless power-transmitting apparatus or not.

[0070] When a predetermined object is determined as being adjacent to the wireless power-transmitting apparatus in the selection phase, the wireless power-transmitting apparatus transmits a ping signal to check whether the object is a wireless power-receiving apparatus. This is referred to as a ping phase.

[0071] When the wireless power-transmitting apparatus receives a response signal of the wireless power-receiving apparatus to the ping signal, it verifies the object to be wirelessly charged and power requirements thereof from the response signal. This is referred to as an identification and configuration phase.

[0072] Next, the variable resonator is controlled, that is, the impedance of the variable resonator is changed according to the verified information, to wirelessly transmit power according to the changed impedance. This is referred to as a power transfer phase.